

REMARKS

The claims have not been amended. Accordingly, claims 1-12 are currently pending in the application, of which claim 1 is an independent claim. Applicants respectfully request reconsideration and timely withdrawal of the pending rejections for the reasons discussed below.

Rejections Under 35 U.S.C. § 103

Claims 1-4 and 9-11 stand rejected under 35 U.S.C. § 103(a) as being allegedly unpatentable over Japanese Patent Application Publication No. 11-273731 filed by Naoki ("Naoki"). Applicants respectfully traverse this rejection for at least the following reasons.

To establish an obviousness rejection under 35 U.S.C. § 103(a), four factual inquiries must be examined. The four factual inquiries include (a) determining the scope and contents of the prior art; (b) ascertaining the differences between the prior art and the claims in issue; (c) resolving the level of ordinary skill in the pertinent art; and (d) evaluating evidence of secondary consideration. *Graham v. John Deere*, 383 U.S. 1, 17-18 (1966). In view of these four factors, the analysis supporting a rejection under 35 U.S.C. 103(a) should be made explicit, and should "identify a reason that would have prompted a person of ordinary skill in the relevant field to combine the [prior art] elements" in the manner claimed. *KSR Int'l. Co. v. Teleflex, Inc.*, 550 U.S. ___, slip op. at 14-15 (2007). Furthermore, even if the prior art may be combined, the combination must disclose or suggest all of the claim limitations. See *in re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991).

Claim 1 recites, *inter alia*:

wherein the linear polymer having P=O bonds is present in an amount ranging from about 0.005 to less than 5 wt% based on the total amount of the electrolyte

Despite the Examiner's continued assertions to the contrary, Naoki fails to teach or suggest at least such features. Rather, Naoki discloses a polymer phosphoric ester occupying 5-20% by volume (paragraph 0026). Although the Office Action states "that the density of most materials is about 1 g/ml" (page 3), the density of Naoki's linear polymer having P=O bonds is greater than 1 g/ml. For example, the density of diethyl vinyl phosphonate is 1.068 g/ml. The Office Action states that "1.068 g/ml is approximately 1 g/ml" (page 8). However, in converting from vol% of polymer phosphoric ester to wt% of polymer phosphoric ester, the density of the electrolyte must be considered. This is because wt% is the weight of an individual component divided by total weight. To determine total weight, the weight of each component is needed. Weight may be obtained by multiplying volume by density. For example, the density of LiBF₄ is 0.852 g/ml. Based on a total volume of 100 ml, the vol% is converted as follows.

$$\frac{5\text{ml} \times 1.068\text{ g/ml}}{5\text{ml} \times 1.068\text{ g/ml} + 95\text{ml} \times 0.852\text{ g/ml}} \times 100 = 6.19$$

$$\frac{20\text{ml} \times 1.068\text{ g/ml}}{20\text{ml} \times 1.068\text{ g/ml} + 80\text{ml} \times 0.852\text{ g/ml}} \times 100 = 23.86$$

Thus, 5-20 vol% of diethyl vinyl phosphate in LiBF₄ electrolyte is converted to 6.19-23.86 wt%. Hence, the vol% of the polymer cannot be used to teach a wt%. The Examiner has failed to provide calculations in support of his assumption that vol% can be used as an estimation of wt%.

Claim 1 recites "wherein the linear polymer having P=O bonds is present in an amount ranging from about 0.005 to less than 5 wt% based on the total amount of the electrolyte."

Thus, the upper end of the range of claim 1 is "less than 5 wt%." Naoki discloses a polymer phosphoric ester occupying 5-20% by volume (paragraph 0026), which does not equate to 5-20 wt%. Since these ranges do not overlap, the question here is whether the claimed range and prior art range "are close enough that one skilled in the art would have expected them to have

the same properties. Titanium Metals Corp. of America v. Banner, 778 F.2d 775, 227 USPQ 773 (Fed. Cir. 1985)" (MPEP § 2144.05.I; emphasis added). The Office Action fails to provide any support or analysis as to how or why an ordinarily skilled artisan would have expected that the linear polymer having P=O bonds "ranging from about 0.005 to less than 5 wt% based on the total amount of the electrolyte" would have the same properties as a polymer phosphoric ester occupying 5-20% by volume. Rather, the Office Action merely states that "[t]he Examiner notes that Naoki's 5% is close enough to Applicant's "less than 5%", such as 4.99%, that they would possess similar properties. The Examiner further points out that the battery performance deteriorates when the polymer exists in the amount exceeding 5%, and not at 5%" (Office Action page 7). However, as noted above, Naoki discloses a polymer phosphoric ester occupying 5-20% by volume, which does not equate to 5-20 wt%. Thus, the Examiner's analysis is flawed and the rejections can not be maintained for at least this reason.

Accordingly, Applicants respectfully request withdrawal of the 35 U.S.C. § 103(a) rejection of claim 1. Claims 2-4 and 9-11 depend from claim 1 and are allowable at least for this reason. Since none of the other prior art of record discloses or suggests all the features of the claimed invention, Applicants respectfully submit that independent claim 1, and all the claims that depend therefrom, are allowable.

Claim 12 stands rejected under 35 U.S.C. § 103(a) as being allegedly unpatentable over Naoki in view of U.S. Patent Application Publication No. 2002/0177027 applied for by Yeager, et al. ("Yeager"). Applicants respectfully traverse this rejection for at least the following reasons.

Applicants respectfully submit that claim 1 is allowable over Naoki, and Yeager fails to cure the deficiencies of Naoki noted above with regard to claim 1. Hence, claim 12 is allowable at least because it depends from an allowable claim 1.

Claims 5-8 stand rejected under 35 U.S.C. § 103(a) as being allegedly unpatentable over Naoki in view of U. S. Patent No. 6,645,671 issued to Tsutsumi, et al. ("Tsutsumi").

Applicants respectfully traverse this rejection for at least the following reasons.

Applicants respectfully submit that claim 1 is allowable over Naoki, and Tsutsumi fails to cure the deficiencies of Naoki noted above with regard to claim 1. Hence, claims 5-8 are allowable at least because they depend from an allowable claim 1.

Accordingly, Applicants respectfully request withdrawal of the 35 U.S.C. § 103(a) rejection of claims 5-8 and 12. Since none of the other prior art of record discloses or suggests all the features of the claimed invention, Applicants respectfully submit that claims 5-8 and 12 are allowable.

CONCLUSION

Applicants believe that a full and complete response has been made to the pending Office Action and respectfully submit that all of the stated grounds for rejection have been overcome or rendered moot. Accordingly, Applicants respectfully submit that all pending claims are allowable and that the application is in condition for allowance.

Should the Examiner feel that there are any issues outstanding after consideration of this response, the Examiner is invited to contact Applicants' undersigned representative at the number below to expedite prosecution.

Prompt and favorable consideration of this Reply is respectfully requested.

Respectfully submitted,

/hae-chan park/

Hae-Chan Park
Reg. No. 50,114

Date: August 1, 2008

CUSTOMER NUMBER: 58027

H.C. Park & Associates, PLC
8500 Leesburg Pike
Suite 7500
Vienna, VA 22182
Tel: 703-288-5105
Fax: 703-288-5139
HCP:YYK/srb